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LIQUID BLEACHING AGENT COMPOSITION

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[There are no amendments to this patent.]

Claims

1. An alkaline liquid bleaching agent, characterized by the fact that it includes hypochlorite and sulfamic acid and/or a sulfamate.

2. The alkaline liquid bleaching agent of Claim 1, characterized by the fact that the content of hypochlorite is 2-8 wt% of the entire composition in terms of effective chlorine, and that the content of sulfamic acid and/or sulfamate as a molar ration relative to hypochlorite is 0.2-1.5.

Detailed explanation of the invention

Industrial application field

This invention pertains to an alkaline bleaching agent using hypochlorite as a bleaching agent and especially pertains to an alkaline liquid bleaching agent in which the odor of chlorine and the abnormal odor that is produced when it comes into contact with the skin are suppressed.

Prior art and problem to be solved by the invention

As a conventional liquid bleaching agent composition, in general, hypochlorite is used especially as a bleaching agent composed of sodium salt. An aqueous solution of hypochlorite has an excellent beaching ability at low temperature, and an aqueous solution containing 5-6 wt% sodium hypochlorite is usually widely available commercially as a home bleaching agent.

However, the aqueous solution of hypochlorite has a strong chlorine odor, and when the aqueous solution of hypochlorite accidentally comes into contact with the skin, for example, the hands during use, an unpleasant specific odor is emitted by the reaction of hypochlorite and the proteins of the skin. Then, since the odor is not easily eliminated even by washing with water, it causes an inconvenience in terms of its use.

Therefore, in order to prevent the chlorine odor of an aqueous solution of hypochlorite, it has been suggested that a perfume be mixed into a bleaching agent composition (Japanese Kokoku Patent No. Sho 54[1979]-25514, Japanese Kokai Patent Application No. Sho 52[1977]-69415); however, that is not sufficiently effective. Especially when the solution comes into contact with the skin, it is ineffective in eliminating the specific unpleasant odor that is produced.

This invention considers the above-mentioned situation, and its purpose is to provide an alkaline liquid bleaching agent that suppresses the chlorine odor of an aqueous solution of hypochlorite and suppresses the unpleasant odor that is produced when an aqueous solution of hypochlorite comes into contact with the skin.

Means to solve the problem and function

These inventors reviewed those facts in earnest to achieve the above-mentioned purpose, and as a result, it was discovered that when sulfamic acid or a sulfamate is added to an aqueous solution of hypochlorite, then not only is the chlorine odor of an aqueous solution of hypochlorite suppressed, but also the specific unpleasant odor that is produced when an aqueous solution of hypochlorite comes into contact with the skin is effectively suppressed. Furthermore, it was discovered that an excellent bleaching ability was maintained without reducing the bleaching effect, even by mixing with sulfamic acids, and this invention was completed.

Therefore, this invention provides an alkaline liquid bleaching agent characterized by the fact that it includes hypochlorite and sulfamic acid and/or a sulfamate.

Next, this invention is further explained in detail.

The alkaline liquid bleaching agent of this invention includes hypochlorite as a bleaching agent and sulfamic acid and/or a sulfamate as an additive for suppressing the chlorine odor and the abnormal odor that is produced when it comes into contact with the skin.

In this case, as a hypochlorite, calcium hypochlorite, potassium hypochlorite, sodium hypochlorite, etc., can be mentioned; however, among them, sodium hypochlorite is preferably used in terms the ease of manufacture and the inexpensive cost. Also, the aqueous solution of sodium hypochlorite can be usually be obtained by passing chlorine through a cool aqueous solution of sodium hydroxide.

The concentration of hypochlorite in an alkaline liquid bleaching agent is not necessarily limited; however, it is preferably 2-8% (wt%, hereinafter, the same), especially 3-6% of the entire composition in terms of effective chlorine. If the concentration is less than 2%, the bleaching ability is sometimes insufficient, and if the concentration is more than 8%, a problem is sometimes caused in stability, etc.

The sulfamic acid to be used in the alkaline liquid bleaching agent of this invention is also called amidosulfonic acid, and it is a solid acid and dissolves well in water. Also, as the sulfamate to be used in this invention, sodium sulfamate, potassium sulfamate, calcium sulfamate, etc., can be mentioned, and they all dissolve well in water and can be suitably used in this invention. Also, these sulfamic acid salts may be used alone or as mixtures of two or more kinds of salts.

The amount of the sulfamic acid and/or sulfamate mixed into an alkaline liquid bleaching agent is not especially limited; however, 0.2-1.5 mol, especially 0.3-1 mol to 1 mol hypochlorite is preferable. If the molar ratio is less than 0.2, it sometimes is insufficiently effective in suppressing the chlorine odor of an aqueous solution of hypochlorite and the specific unpleasant odor that is produced when it comes into contact with the skin. If it is more than 1.5 mol, the bleaching ability is sometimes lowered.

Also, in the alkaline liquid bleaching agent of this invention, in order to make its pH alkaline, alkalizing agent such as a carbonate, subcarbonate, phosphate, condensed phosphate, silicate or hydroxide of alkali metal or alkaline-

earth metals, etc., can be added. Thus, the bleaching ability is improved, and the stability of hypochlorite is also improved.

In the alkaline liquid bleaching agent of this invention, if necessary, components to be used in an ordinary composition can be used. As these components, for example, surfactants such as sodium polyoxyethylene nonylphenyl ether sulfate, sodium alkyl diphenyl ether disulfonate, alkylamine oxide, alkyltrimethylammonium chloride and benzalkonium chloride can be mentioned. Furthermore, if necessary, perfumes, coloring agents (pigments), etc., can also be added.

Effect of the invention

The alkaline liquid bleaching agent of this invention effectively suppresses the chlorine odor of an aqueous solution of hypochlorite and the specific unpleasant odor that is produced when an aqueous solution of hypochlorite comes into contact with the skin, and it markedly improves the usability thereof by the addition of sulfamic acid and/or a sulfamate.

Also, a favorable bleaching ability due to hypochlorite is maintained without influencing the bleaching effect by adding sulfamic acids.

Next, this invention is explained in detail by showing application examples and comparative examples; however, this invention is not limited to the following application examples.

Application Examples 1-4 and Comparative Examples 1-3

The liquid bleaching agent compositions described in Table I were prepared, and an alkalinity of pH 13.0 was obtained by the addition of NaOH. Next, the chlorine odor of each composition and the specific odor produced when it comes into contact with the skin were functionally evaluated by a panel of five members. The results are shown in Table I.

Also, the evaluation standard for the chlorine odor of each composition and the specific odor that is produced when it comes into contact with the skin is as follows, and the result shown is the average value from a panel of five persons.

Chlorine odor of composition

3: Strong chlorine odor is detected
2: Chlorine odor is detected
1: Slight chlorine odor is detected
0: No chlorine odor is detected

Specific odor that is produced when the composition comes into contact with the skin

After the fingers of each member of the panel are immersed in the composition and then immediately washed with city water, the specific odor on the fingers is evaluated.

3: Strong specific odor is detected
2: Specific odor is detected

1: Slight specific odor is detected

0: No specific odor is detected

Table I

		実施例				比較例		
		1	2	3	4	1	2	3
液体漂白剤組成物	NaClO量 (%)	6	6	6	6	2	6	8
	添加剤種類	スルファミン酸ナトリウム	スルファミン酸ナトリウム	スルファミン酸ナトリウム	スルファミン酸	-	-	-
	NaClO／添加剤 (モル比)	1/0.2	1/0.5	1/1.0	1/0.5	-	-	-
	pH							
臭気	組成物塩素臭	1.2	0.4	0.2	0.6	2.4	2.8	3.0
	組成物が皮膚に付着した際に発生する特異臭	2.0	1.2	0.6	1.2	2.6	3.0	3.0

Key: 1 Application examples
2 Comparative examples
3 Liquid bleaching agent composition
4 Odor
5 Amount of NaClO (%)
6 Kind of additive
7 NaClO/additive (mol ratio)
8 Chlorine odor of the composition
9 Specific odor that is produced when the composition comes into contact with the skin
10 Sodium sulfamate
11 Sulfamic acid

From the results of Table I, it is seen that in the alkaline liquid bleaching agent in which sulfamic acid or its salt is added to sodium hypochlorite, both the chlorine odor and the specific odor are greatly suppressed.

Application Example 5 and Comparative Example 4

The liquid bleaching agent compositions described in Table II were prepared, and similarly to Application Examples 1-4, the chlorine odor of each composition and the specific odor that is produced when it comes into contact with the skin were functionally evaluated by a panel of five persons.

Also, according to the following method, a bleaching test was carried out using a fabric contaminated with tea, and the intensity of bleaching ability and the reflectivity (bleaching rate) of a bleached fabric were measured and evaluated. Also, the bleaching conditions are as follows.

Concentration of bleaching agent: 1% solution
Bleaching temperature: 25°C
Bleaching time: 30 min
Fabric contaminated: tea fabric [described below]
Bath ratio: 100 times
The results are shown in Table II.

Bleaching effect test

A plain weave cotton fabric (#100) is washed at 50°C and at a bath ratio of 30 for 15 min with a commercial detergent (Blue Dia® [transliteration]) in a washing machine and it is dewatered for 5 min. It is washed and dewatered again by the same operation. Then, after an overflow rinse is carried out for 15 min, it is dewatered for 5 min. The overflow rinse and dewatering operation is repeated 5 times in total, and it is dried with air. This is taken to be the pretreated fabric.

Next, 2% tea solution is boiled for 5 min, and the above-mentioned pretreated fabric is immersed at a bath ratio of 30, boiled for 30 min, held at 40°C for 30 min and dried with air. It is used as a test fabric (tea fabric).

The bleaching agent compositions of the application examples and the comparative examples are respectively added to city water at 25°C to a concentration of 1%, and the tea fabric is immersed at a bath ratio of 100 into it and is held for a prescribed time (30 min). The test fabric treated is dewatered for 1 min by a washer, and an overflow rise for 1 min and a dewatering for 1 min are carried out in order. Then, it is dried by ironing. This is taken to be the bleached fabric.

The reflectivities of the above-mentioned pretreated fabric, tea fabric and bleached fabric were respectively measured using a photoelectric reflectivity altimeter (ELREPHO, made by Carl Zeiss Co.), and the bleaching rate was secured by the following equation.

Bleaching rate (%) = ((reflectivity of bleached fabric - reflectivity of tea fabric)/(reflectivity of pretreated fabric - reflectivity of tea fabric)) x 100

Table II

		① 実施例5	② 比較例4
③ 液体漂白剤組成物 (%)		NaClO 5%	NaClO 5%
		ポリオキシエチレンノニルフェニルエーテル硫酸ナトリウム (p=8) ⑧ 1	ポリオキシエチレンノニルフェニルエーテル硫酸ナトリウム (p=8) ⑧ 1
		NaOH 1.0	NaOH 1.0
		スルファミン酸ナトリウム ⑨ 5	香料 ⑩ 0.1
		⑪ 水 残	⑪ 水 残
⑥	⑫	計 100%	⑫ 計 100%
		pH 12.5	pH 13.0
④ 臭気	組成物塩素臭	0.4	1.0
	組成物が皮膚に付着した際に発生する特異臭 ⑦	1.0	2.8
⑤	漂白率 (%)	73	75

Key:
1 Application Example 5
2 Comparative Example 4
3 Liquid bleaching agent composition (%)
4 Odor
5 Bleaching rate (%)
6 Chlorine odor of the composition
7 Specific odor that is produced when the composition comes into contact with the skin
8 Sodium polyoxyethylene nonylphenyl ether sulfate (p = 8)
9 Sodium sulfamate
10 Perfume
11 Water: the remainder
12 Total 100%

From the results of Table II, it is seen that in the alkaline liquid bleaching composition containing sulfamic acid, both the chlorine odor and the specific odor are greatly suppressed, and an excellent bleaching ability, equal to that of a conventional bleaching agent, is exhibited.